



# Impact of Pharmacist Patient Education on Asthma Control

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## Background

The Global Initiative for Asthma has cited improved access to asthma education as an example of high-impact intervention in asthma management. Considering specifically the aspect of medication administration, several studies have investigated the effectiveness of inhaler use demonstration (teach-back) as a means of improving patient asthma knowledge and asthma control. However, data pertaining to pediatric-specific pharmacist patient education is sparse.

## Objectives

The objective of this study was to evaluate the relationship between pharmacist patient engagement and provision of patient educational materials with pediatric asthma control.

## Methods

### Study Design:

- Multi-centered, convenience sample, in-person survey study
- Participants were recruited from an urban, academic medical center general pediatric unit, two asthma clinics and local churches between April 2015 and September 2017.

### Inclusion Criteria:

- Parent of a child age 0-18 years with asthma

### Survey

- The IRB-approved 20-minute survey included caregiver/child demographics, outpatient pharmacist interactions, and the child's asthma control. Participants were asked to rate asthma control with regard to oral steroid use, daytime/nighttime symptoms, impact on activities of daily living, and use of rescue medications. National Heart, Lung, and Blood Institute asthma clinical practice guidelines were used to classify asthma control as "well-controlled" and "not well-controlled".
- Assessment of caregiver-reported interactions with their outpatient pharmacist included request for inhaler use demonstrations (teach-back, RPh1), receipt of written instructions (RPh2), review of provided instructions (RPh3), and ease of instruction understanding (RPh4). Question RPh1, RPh2, and RPh3 scored as: never=1, not very often=2, some of the time=3, most of the time=4, every time=5, so that the higher the score, the more time spending. A score of >3 was considered as tending to spend more time. Question RPh4 scored as: very hard=1, somewhat hard=2, neither hard nor easy=3, somewhat easy=4, very easy=5, so that the higher the score, the easier. A score of >3 was considered as tending to be easier.

### Data Analysis:

- Chi-square or Fisher's exact test were used to detect differences in demographics between patient asthma control. To compare pharmacist teach back of inhalers versus patient asthma control, t-test was used. To adjust any covariates for the associations of pharmacist teach back of inhalers and patient asthma control, logistic regression was applied.

**Table 1. Demographics**

Characteristics	Patient asthma control		Total (n=68)	p value <sup>1</sup>
	Well controlled (n=13, 19.1%)	Not controlled (n=55, 80.9%)		
<b>Participant Relationship</b>				0.02*
Self	6 (46.2)	6 (10.9)	12 (17.6)	
Parent	6 (46.2)	45 (81.8)	51 (75.0)	
Grandparent	0 (0)	1 (1.8)	1 (1.5)	
Other	1 (7.7)	3 (5.5)	4 (5.9)	
<b>Gender</b>				0.5
Male	5 (38.5)	28 (50.9)	33 (48.5)	
<b>Paid by</b>				0.8
1 Medicaid, medical or PA	8 (61.5)	33 (60.0)	41 (60.3)	
2 Private insurance	5 (38.5)	15 (27.3)	20 (29.4)	
3 Self-pay/cash	0 (0)	1 (1.8)	1 (1.5)	
1 + 3	0 (0)	2 (3.6)	2 (2.9)	
2 + 3	0 (0)	4 (7.3)	4 (5.9)	
<b>Education<sup>2</sup></b>				0.5
Some high school	3 (25.0)	8 (14.6)	11 (16.4)	
High school graduate	3 (25.0)	25 (45.5)	28 (41.8)	
Some college	4 (33.3)	15 (27.3)	19 (28.4)	
4 year college graduate	2 (16.7)	7 (13.4)	9 (13.4)	
<b>Employed</b>				0.5
No	1 (7.7)	12 (21.8)	13 (19.1)	
Part time	5 (38.5)	14 (25.5)	19 (27.9)	
Full time	7 (53.9)	29 (52.7)	36 (52.9)	
<b>Health care provider<sup>3</sup></b>				0.05
No	12 (92.3)	40 (72.7)	52 (76.9)	
Yes	0 (0)	15 (27.3)	15 (23.1)	
Unsure	1 (7.7)	0 (0)	1 (1.5)	
<b>Family income</b>				0.7
Less than \$10,000	1 (7.7)	2 (3.6)	3 (4.4)	
\$10,000-19,999	0 (0)	5 (9.1)	5 (7.4)	
\$20,000-29,999	2 (15.4)	7 (12.7)	9 (13.2)	
\$30,000-39,999	3 (23.1)	6 (10.9)	9 (13.2)	
Over \$40,000	4 (30.8)	18 (32.7)	22 (32.4)	
Declined to state	3 (23.1)	17 (30.9)	20 (29.4)	

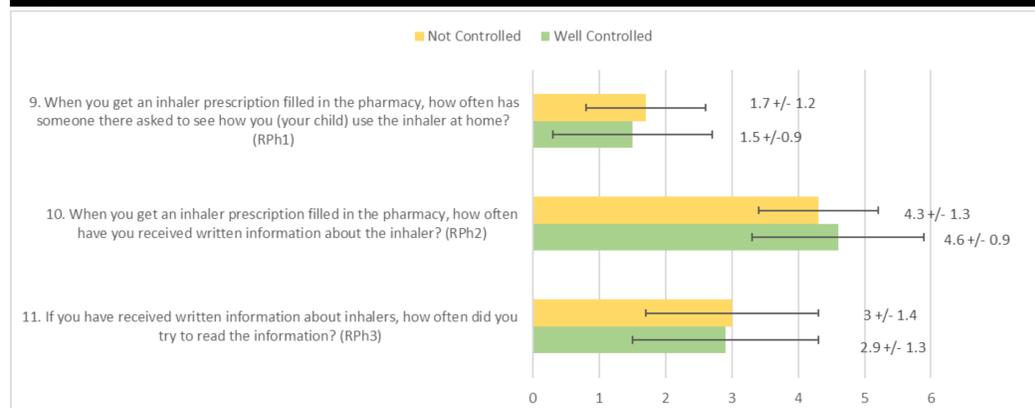
Data were presented as mean (SD) for continuous and number (column percent) for categorical variables; \*statistically significant

<sup>1</sup> p value were computed using t-test and chi-square test or Fisher's exact test

<sup>2</sup> frequency missing = 1

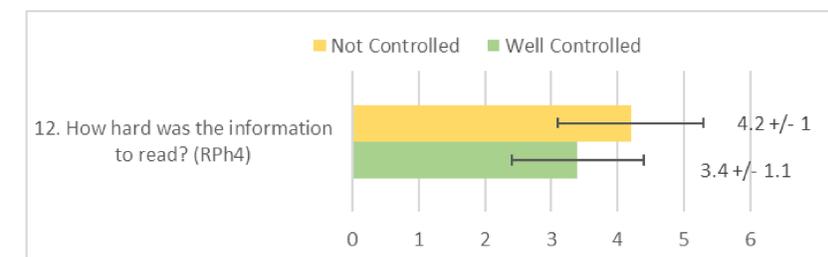
<sup>3</sup> unsure was excluded in Fisher's exact test

**Figure 1. Mean Score of Pharmacist Teach Back Questions**



Conversion to a 5-point scale as follows: never=1, not very often=2, some of the time=3, most of the time=4, every time=5, so that the higher the score, the more time spending. A score of >3 was considered as tending to spend more time.

**Figure 2.**



Conversion to a 5-point scale as follows: very hard=1, somewhat hard=2, neither hard nor easy=3, somewhat easy=4, very easy=5, so that the higher the score, the easier. A score of >3 was considered as tending to be easier.

## Results

- Sixty-eight respondents were included in the study. Respondent was a caregiver in 82.4 percent and child (ages 4 to 18) in 17.6 percent.
- No correlation (p=0.7) was found between pharmacist teach-back (RPh1) and asthma control. The mean RPh1 score was similar among both asthma control categories ("well controlled" 1.5 +/- 0.9, "not well controlled" 1.7 +/- 1.2, p=0.4).
- Ease of understanding (RPh4) showed a preliminary statistically significant relationship with asthma control (p=0.01). However, after adjusting for caregiver relationship, RPh4 no longer demonstrated significant impact on asthma control.
- When analyzing respondent demographics, "well controlled" asthma was 7.5 times more likely in the 'self'-relationship (respondent is the child) compared to a caregiver relationship (OR=7.5, 95% CL= (1.8, 31.0)).

## Conclusions

In this small study, no difference was found between the 'well-controlled' and 'not well-controlled' group regarding pharmacist using teach-back in the outpatient setting. However, this study identified missed opportunities for improvement in outpatient pharmacist interventions. Additionally the large odds ratio calculated for those providing self-care with asthma control may indicate a need to shift patient education focus. Acknowledging the large confidence interval for the odds ratio (1.8, 31.0), even the low end could suggest targeting pharmacist patient education to the patient not the caregiver, whenever possible, may yield greater improvement in asthma control. More data is needed to verify these results.

## Bibliography

Badaczewski A, Bauman L, Blank A, et al. Relationship between teach-back and patient centered communication in primary care pediatric encounters. Patient Educ Couns. 2017 Jul; 100(7):1345-52.